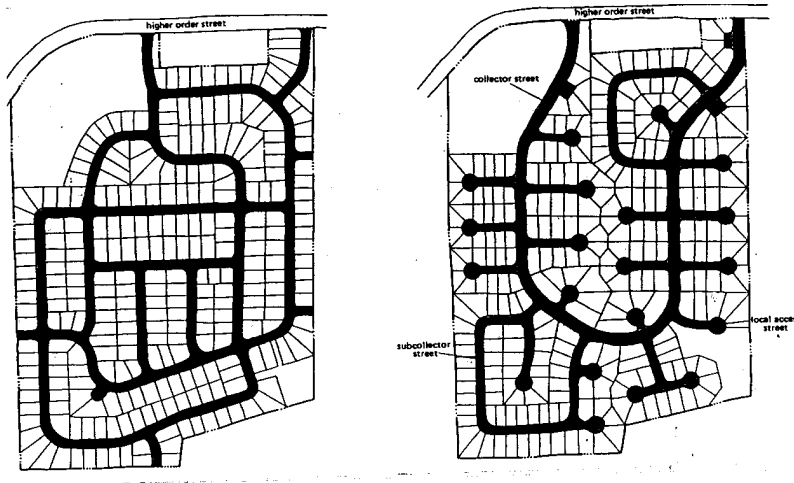


# Streets

## Summary of Issues

Since the end of World War II, the system of thoroughfare planning and street layout employed by most U.S. cities has sought to direct the great bulk of all new traffic onto a limited number of major thoroughfares. The old, gridiron network of streets, so prevalent before the war, and which provided for a multitude of alternative routes, was not extended as cities grew. Instead, new residential subdivisions were designed to direct all incoming and outgoing traffic to just one or two outlets- and usually onto the closest major thoroughfare.



*A city plan must ever deal mainly with the direction and width of its streets.*

**Daniel Burnham, 1905**

The two contrasting street layouts to the left were taken from a 1980 publication entitled **Performance Streets: A Concept and Model Standards for Residential Streets** by the Bucks County, Pennsylvania Planning Commission. In the booklet, the authors are critical of the well-connected, walkable network of streets on the far left for "failing to collect traffic and direct it to an increasingly higher order street", like the "preferred" layout on the near left. (Note the abundance of cul de sacs and only two ways out of the development.)

In addition, land use patterns changed dramatically from a pre-war, fine-grained mix of residential and neighborhood serving businesses, to a post-war, separation of new residential subdivisions from places of employment, shopping and gathering. This separation of uses, in turn, has created a near total dependence on the automobile for daily activities. Salisbury has been no exception, having pursued a similar system of thoroughfare and land use planning over the past several decades.

Today, the unfortunate consequences of the post-war model of land development and street planning are becoming increasingly evident as the City's few major thoroughfares struggle to meet the travel demands caused by heavy automobile dependency. The City's few major streets must meet not only the needs of cross-town traffic, but must also absorb the traffic created by numerous short distance errands. Suburban residents, separated and unconnected from places of work, shopping, and gathering (i.e., schools, churches, parks, etc.) must rely upon their automobile for nearly every activity not directly related to the home. Whether it is to get a gallon of milk, or chauffeur a son or daughter to an activity at school, most trips involve at least some leg of the trip on a thoroughfare. As a result, traffic counts on many of the city's most important thoroughfares, including East Innes Street, Statesville Boulevard, and Jake Alexander Boulevard, have been increasing at many times the rate of the city's population growth.



Unless something is done to change the way residential and commercial service areas are connected (or more accurately, not connected today), these major streets are at risk of becoming totally congested in the near future. Therefore, in the coming decade, the City must rethink the dysfunctional post-war model of separated land uses and unconnected street layout. In doing so, it must allow new developments to place residential and non-residential activities within walking distance of each other. The City must allow major thoroughfares to focus on meeting the needs of cross-town traffic while allowing minor streets within neighborhood planning areas to play a greater role in serving local errands. It must return to a model of land development and street layout more closely resembling the pre-war traditional neighborhoods of old.

## POLICIES FOR MAJOR STREETS

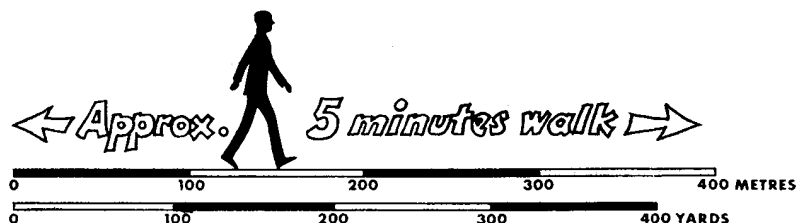
*Note: The term "major street" is used interchangeably with the term "thoroughfare" in this section. Also of note, while the Thoroughfare Plan for the City of Salisbury currently distinguishes between "major" and "minor" thoroughfares, this plan does not. It simply recognizes that some major streets will be larger than other major streets.*

***Policy S-1: Major streets should be spaced no more than one mile apart east to west and north to south, whenever topographic and other physical conditions allow.***

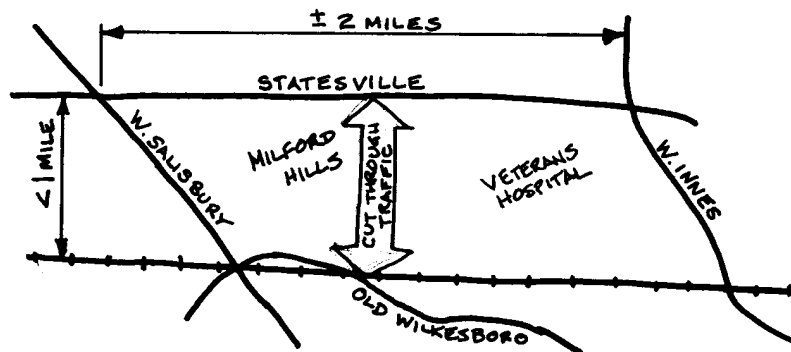
In addition to carrying cross-town traffic, major streets (meaning both major and minor thoroughfares), also define neighborhood planning areas (i.e. if major streets are spaced no more than one mile apart, they will form neighborhood planning areas of no more than one mile square). The spacing of the city's major streets therefore, has important implications for neighborhood design and livability.

Studies have shown that many people will walk one-quarter mile (about 5 minutes) rather than using their car over the same distance. (It often does not make sense to go to the trouble of using and parking the car over such a short distance.) With this understanding, an area approximately one-quarter mile in radius from the center of a neighborhood planning area can be captured as a "pedestrian pocket". Residents of the remaining areas outside this one-quarter mile radius pedestrian pocket, but within the one square mile neighborhood planning area can still reach the center by bicycle or car. Alternatively, it may be better to provide for more than one pedestrian pocket within a single neighborhood planning area, thereby bringing an even larger number of residents within convenient walking distance of neighborhood services.

Many people will walk, rather than drive a car, if their destination is less than a quarter mile away.



In addition, if the spacing of major streets east and west or north and south is significantly more than one mile, there is a greater tendency for motorists to try to cut through the neighborhood planning area rather than going "around the horn". This problem can be observed in Salisbury in the Milford Hills area, which is located in a very "wide" neighborhood planning area. In this case, Statesville Boulevard and Old Wilkesboro Road are less than one mile apart north to south, but Salisbury Boulevard and West Innes Street are nearly *two miles* apart west to east. As a result, there is strong demand for cut through traffic on McCoy Road through the neighborhood.



*Drainage will not run uphill to suit the prettiest plan; nor will people, to please the most imperious designer, go where they do not want to go or abstain from going where they must needs go. . .*

**Raymond Unwin, 1909**

The Milford Hills/Veterans Hospital Planning Area is nearly two miles wide from West Salisbury to West Innes Street. Because this distance is substantially more than a mile, traffic has a desire to cut through the Milford Hills neighborhood.

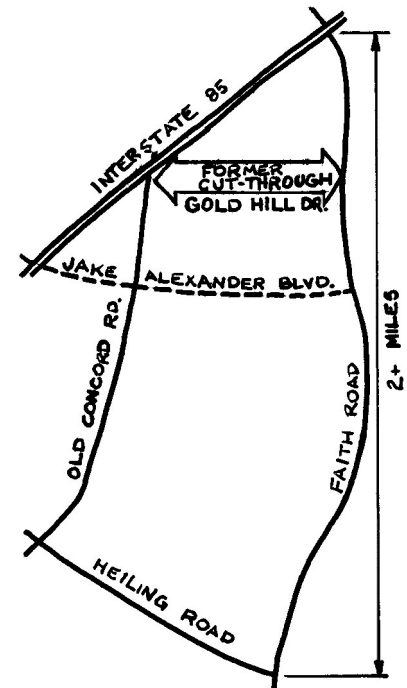
Another example of the impact of major street spacing on traffic patterns can be observed in the Morlan Park neighborhood on the east side of I-85. In this case, the extension of Jake Alexander Boulevard in 1998 dramatically reduced cut through traffic on Gold Hill Drive through the Morlan Park neighborhood. Before Jake Alexander Boulevard was extended, motorists found Gold Hill Drive a convenient way to get from Old Concord Road to Faith Road. When Jake Alexander Boulevard extension was constructed, offering a better alternative, traffic counts on Gold Hill Drive quickly dropped from about 5,000 vehicles per day to less than 1,800 vehicles per day, a decline of more than 60%.

Finally, it should be noted that strict adherence to a policy of placing major streets in a uniform one mile grid will not always be possible in the rolling, stream-dissected topography of Salisbury and Rowan County. The policy simple states that this is a goal, which should be pursued, provided that topographic and other physical constraints can be overcome.

**Policy S-2: Access to major streets shall be from intersecting minor streets, rather than private driveways, whenever possible.**

This policy seeks to preserve the traffic moving capability of the City's major streets, and in so doing, protect the investment of the taxpayer in the costs of road construction. In the past two decades, the cost of building new thoroughfares has skyrocketed. In 1998, the extension of Jake Alexander Boulevard was completed from Old Concord Road to its intersection with Stokes Ferry Road, one block past U.S. 52, at a cost of just under \$5 million for the 1 and 1/2 mile section.

The City can ill afford to destroy the traffic carrying ability of its few major streets. Nor should the City allow unnecessary driveway cuts to neutralize the value of road construction dollars provided by Federal, State and local taxpayers. (Frequent driveways allow for unpredictable stops and vehicle



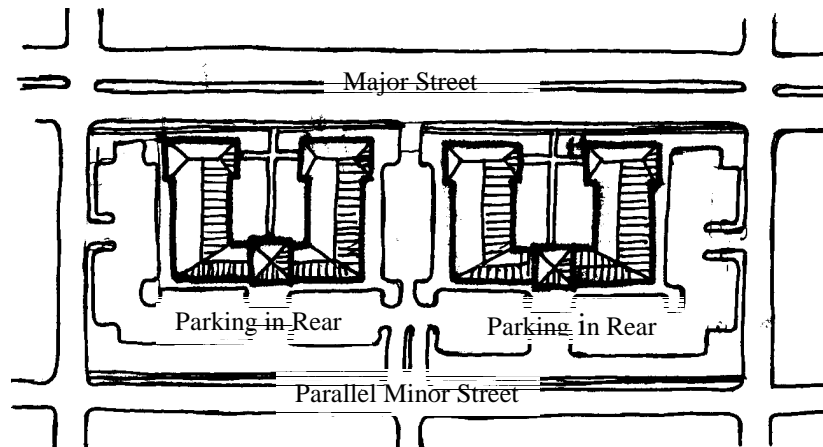
The diagram above shows how the extension of Jake Alexander Boulevard from Old Concord Road to Faith Road alleviated cut-through traffic on Gold Hill Drive in the Morlan Park neighborhood. The height of the neighborhood planning area defined by Faith Road was reduced from over 2 miles to less than 1 mile.

turning movements, causing increased congestion, and greater opportunities for traffic accidents.)

By permitting access to major streets only from intersecting minor public streets, the traveling motorist will benefit from a less congested, safer street. At the same time, the taxpayer has a greater assurance that future tax bills for road construction will not throw good money after bad.

With this arrangement, new businesses or subdivisions would be required to gain access first to either: (a) an intersecting street or (b) a smaller street parallel to the major street. The smaller parallel street could be in the form of a frontage street separated by a median strip from the through lanes of the major street, or it might run directly behind the business(es) or subdivision(s), parallel to the major street. In the latter case, a parallel street running behind a number of businesses has the added advantage of allowing convenient access to parking lots behind the businesses, out of the sight of the traveling public. Buildings can then be pulled up closer to the major street, allowing for better exposure, and the incorporation of business signage into the building design rather than necessitating free standing, pole-mounted signs.

A minor street running parallel to a major street allows buildings to be pulled up to the major street, and unsightly parking areas to be placed in the rear.



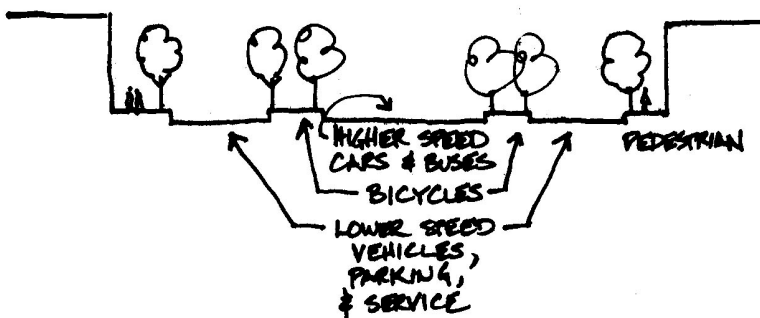
Finally, it must be recognized that there will be some properties where access to a parallel street or an intersecting public street is simply not possible. The property in question may be land-locked by surrounding parcels or by physical constraints, such as a stream or railroad. In such situations, a driveway directly onto the major street may be the only option available. When this is the case, the property owner should be encouraged to design an access point which minimizes disruption to the traffic flow, and to the extent possible, complements the pattern of street intersections, so as to minimize unpredictability and enhance safety for the motorist.

***Policy S-3: Central medians shall be incorporated into the design of new or improved major streets whenever possible.***

In the town meetings held for the Comprehensive Plan, residents complained that the streets on which they most frequently travel are also the ones that they most dislike, both functionally and visually. There is near universal agreement, for example, that the commercial sections of East Innes and Statesville Boulevard, as well as some recently developed sections of Jake Alexander Boulevard, are ugly and dysfunctional. One way to help alleviate these problems is to provide for properly designed and landscaped central medians in these major streets. Such medians can perform a functional as well as aesthetic purpose and provide some character where little or none exists. Explanation follows.



Median strips can: (a) physically separate traffic moving in opposing directions, or in the same direction but at different speeds (b) prevent uncontrolled, unpredictable and unsafe traffic movements across (perpendicular to) the main flow of traffic, (c) create a safe landing for pedestrians one half of the way across a major street, and (d) provide a planting area for landscaping and/or streetlights to enhance the traveling experience and image of the community.



Planted median strips help with traffic control, make major streets more amenable to pedestrians, and make for a more attractive community.

Interestingly, a decision was recently made by the North Carolina Department of Transportation to introduce a central median in U.S. 70 (Statesville Boulevard) from Salisbury to the City of Statesville. The central median will have a width of about 18 feet in the urbanized road section in Salisbury, and will increase to about 30 feet in width in the

more rural sections of the road. In arguing for the central median, representatives of the City of Salisbury cited numerous studies from across the country showing that median divided roadways had significantly fewer accidents, and had no noticeable impact on business operations fronting on the roadway, when compared to five lane cross sections.

Note: There is a supportive relationship between Policy S-2 above, regarding access to major streets, and this policy, regarding central medians. When individual driveways are given direct access to a major thoroughfare, and no central street median is present, motorists may attempt to cut across the main flow of traffic during even the heaviest travel periods. If, however, crossing movements and u-turns are limited to locations controlled by openings in the central median (typically public street intersections) safe, predictable turning movements are encouraged. Even better, if access to the major street is limited to public street intersections, rather than individual driveways as per Policy S-2, the desire for crossing movements into and out of individual driveways is non-existent. The median is therefore no longer serves as the primary deterrent to uncontrolled business access. Rather, the policy of no driveway access, except onto side streets or slower speed service lanes, is the controlling factor. Thus, this policy essentially places all business owners along the thoroughfare on an even footing.

Central medians, when properly designed, also serve as "safe islands" for pedestrians trying to cross a major thoroughfare. (The need for pedestrian crosswalks was a concern voiced by city residents at the town meetings.) Consider how much easier it is, for example, for pedestrians to cross West Innes Street in the older section of the city where a central median is present, than to cross the same street farther out, where no medians are provided. Consider also, the change in behavior of motorists toward pedestrians crossing West Innes near Catawba College, after the central median was installed there.



In still other instances, bermed or heavily planted central medians can be employed to discourage random or unsafe pedestrian crossings, and to direct pedestrians to designated safe crossing locations.

Finally, from an aesthetic standpoint, median strips can provide valuable opportunities for landscaping, including street trees and streetlights, as detailed in Policy S-5.



**Policy S-4: Under specified conditions, minor streets should be located so as to intersect with major streets at regularly spaced, reasonably frequent (400' to 600') intervals.**

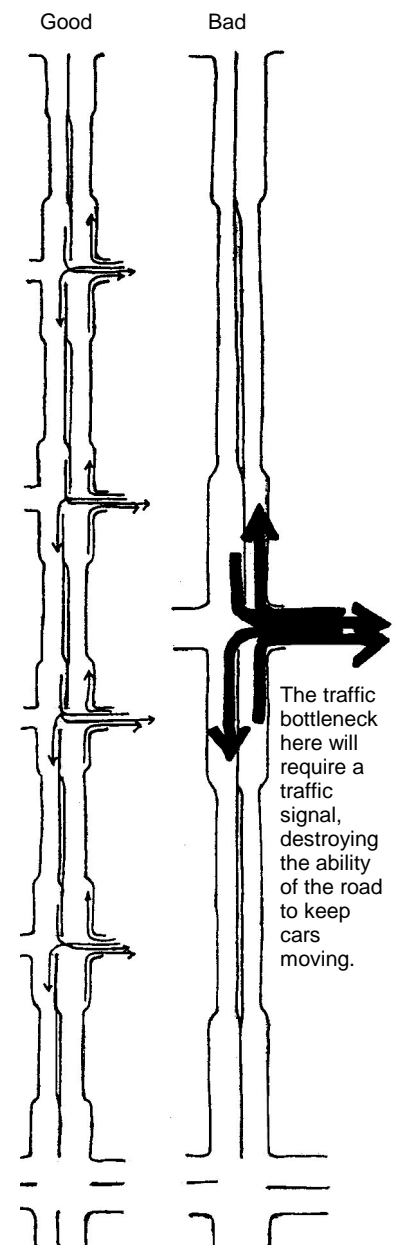
This recommendation applies most directly to relatively new thoroughfares such as Jake Alexander Boulevard. This policy requires a detailed description for three reasons: (1) because it takes a contrasting approach from mainstream post-war practice regarding street planning and layout, (2) because it offers considerable benefit to the solution of long term traffic problems, as well as promoting good city design, and (3) because there are several conditions which must be in place when this policy is employed.

From the outset, this recommendation assumes that there is going to be *some* at-grade access to the major street. That is, the major street is not a limited access (no-access-except-at-cloverleaf) expressway. The question then becomes: "What is the best way to provide at-grade access while preserving the traffic moving function of the major street?"

The City currently relies upon the State Department of Transportation to establish and carry out access policy for major streets (DOT maintained streets) in Salisbury. Generally, DOT's policy toward has been to limit access to as few locations as possible. Further, such access is preferred to be by "collector level" streets, thereby funneling traffic to a few controlled intersections. Despite the best intentions of this policy, experience across the state shows that, as the surrounding area fully develops, this approach leads to traffic tie ups at these few access points. Over time, this policy creates traffic *bottlenecks* at the few collector level intersections allowed. The bottlenecks occur from motorists trying to get into and out of the interior of the adjoining land area through a very limited number of "portals".

Practical examples of this policy are taking shape at the entrances to several of the area's existing suburban developments. What do all of these developments have in common? They all have a relatively large number of lots that must rely upon only one or two portals for entering or exiting the development. While traffic problems may not be evident during the early years of the development, the basic foundation for future problems has been set. Eventually, as the subdivision and surrounding area fully develop, motorists will experience problems entering and exiting the few portals of these limited access developments. To assist in letting people in and out of such a development, a traffic signal is then installed, thereby degrading the traffic moving ability of the major street<sup>1</sup>.

<sup>1</sup> Traffic lights do more to degrade the traffic moving ability of roads than most other factors. So long as traffic does not come to a complete stop, the traffic moving ability of a traffic lane can be maintained at a fairly high level. In fact, studies have shown that the highest volume of a traffic lane is approximately 2000 passenger vehicles per hour, when vehicles travel at about 30 miles per hour. This is because drivers generally follow behind one another in a more dense formation at 30 mph than they typically do at higher speeds. So long as the line of traffic keeps moving, even if at a slower (25-30mph) speed, a large volume of traffic can be moved efficiently. If, however, a line of cars must come to a complete stop at a traffic light, the traffic moving ability of the roadway plummets. More specifically, studies have shown that the addition of two traffic signals, 1000 feet apart, will reduce the traffic capacity of a major street by 75%. *Therefore, one of the primary objectives of any highway access program which seeks to preserve the traffic moving integrity of a major street should be to avoid the need for traffic lights.* (Source: Traffic Engineering Handbook, ITE Washington, DC, and Dan Mikkelsen, City of Salisbury Transportation Engineer)



A better alternative is to *distribute* the volume of trips over a number of regularly spaced, reasonably frequent (i.e. every 400' to 600') streets.<sup>2</sup> Several very important conditions go hand in hand with this recommended street pattern, however.

*First, there must be little or no direct driveway access to the thoroughfare from adjacent properties.* This means that motorists may enter the thoroughfare only where predictable street intersections occur.

*Second, a central median can be helpful in restricting crossing movements only to locations made available by the median.* This means that all traffic movements into and out of the majority of streets intersecting with the thoroughfare will be a right hand turn. Note, too, that even if there is an opening in the central median at most public street intersections, the difficulty in crossing the traffic stream during rush hour traffic has a self-regulating effect; motorists soon learn that it is easier to make a right hand turn out during these periods. Thus, the motorist is given a measure of credit for common sense driving.

*Third, for thoroughfares with design speeds of 45 mph or more, acceleration and deceleration lanes are advisable.* This will help facilitate the smooth entry and exit of cars into and out of the higher speed travelways— necessary even at right hand turn entry portals.

*Fourth, the land development and interior street pattern of the neighborhood planning area must adhere to the principles outlined in this report.* This means, for example, that large scale or high traffic volume developments are limited to locations at the corner(s) of the neighborhood planning area. It also means that some trips will be dispersed by the internal street network of the neighborhood planning area (i.e. providing an alternative to all trips immediately entering the major thoroughfare).

*Fifth, opportunities for left hand turns and u-turns must be incorporated into the street design.* This means that crossing movements, left hand turns and u-turns will generally occur only at less frequent, predetermined cross streets. *Cars using these left hand turn locations need not compete, however, with a high volume of cars making right hand turns—*most of this volume will have been distributed and handled by other portals into the neighborhood planning area. *Perhaps equally important, by dispersing traffic among many outlets, the traffic volumes on these cross streets can be brought down to comfortable levels, making life along these “portal” streets amenable to residents who live along them.*

As an aside, frequent intersecting streets also ease the pressure from adjacent property owners who normally push for direct access from individual businesses to the thoroughfare. This is entirely consistent with recommendation S-1 above. When streets are fairly frequent, access to adjacent properties is enhanced without compromising the integrity of the thoroughfare. Thus, the type of regularly spaced streets described above offer a reasonable and proper planning solution for all parties involved.

*Suburban traffic problems are the planning plague of the 1990's. These problems will not go away until planners and policymakers understand how transportation and land use patterns affect one another, and until they make planning decisions that address traffic congestion by managing land use.*

**Lincoln Institute for Land Policy**

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<sup>2</sup> Traffic engineers typically recommend a minimum spacing of 250 feet between access points (including driveways) in 35 mph zones and a minimum spacing of 500 feet between access points in 45 mph zones. Policy S-4 considers access points to be intersecting public streets only; it excludes private driveways from consideration or use for reasons previously given.



Finally, beyond solving the traffic problem, all of the conditions mentioned above are just good planning—they will result in better, more livable neighborhoods where these policies are enforced.

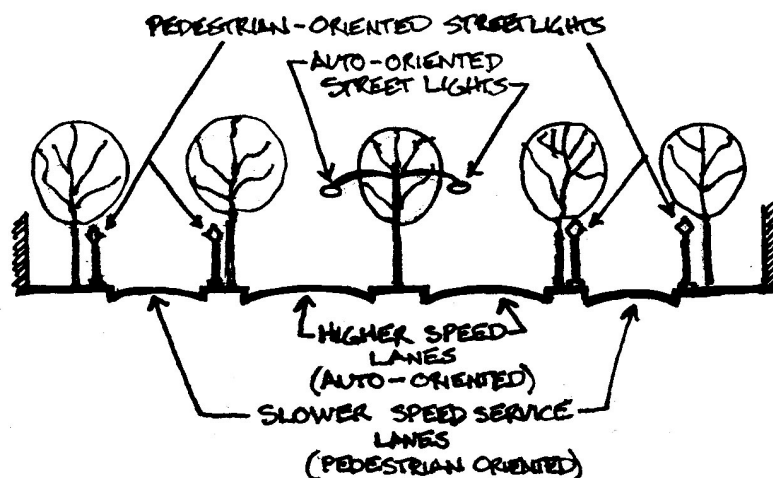
***Policy S-5: Landscaping, and where possible, street trees should be planted in central medians and plaza strips of major streets.***

Whether as residents or visitors, more people see Salisbury from the city's major thoroughfares than from any other vantage point. As noted previously, local residents view the area's major streets as some of the most visually blighted sections of the community. One can only wonder what visitors from outside the community, not yet immune to such appearances, perceive.

The addition of full sized street trees down the middle and along the sides of the city's major thoroughfares would be effective in creating a street space currently lacking, due to the large setbacks of buildings and expansive "sea of asphalt" parking areas. First priority, therefore, of any street tree-planting program, should be along the city's major thoroughfares. (More on this in the **Street Tree** chapter.)

***Policy S-6: Streetlights shall be selected and installed according to the design speed and intended use of the street they serve.***

Currently, large-scale "cobra head" style streetlights are used along most streets in the city no matter what the design speed or intended use of the street. Under this policy, even pedestrian-scaled streets seem to be given over to the automobile. It would be better to use such automobile-oriented street lights where the motorist is indeed dominant, but use pedestrian scaled lights along slower moving streets with sidewalks where the pedestrian must also be accommodated.



Higher speed, automobile oriented streets work best with taller, "cobra head" streetlights. Slower speed, pedestrian oriented streets should have shorter, more frequently spaced streetlights.

The preceding sketch shows how even a multi-lane avenue with through lanes in the middle and service streets along its edges can successfully employ two different kinds of streetlights according to the character and speed of the particular street they serve. In the center lanes, where the design speed may be 45 mph or greater, cobra head style streetlights

*The difficulties of such public control are undoubtedly very great, but the evils which result from absolute lack of control are even greater... That there may be great difficulty in establishing a criterion for judging hardly seems a sufficient reason for making no attempt whatever to criticize or veto buildings which, to quote Robert Louis Stevenson, "belong to no style of art, only to a form of business much to be regretted."*

**Raymond Unwin, 1909**



*"You can't pave your way out of congestion."*

**-Unknown**

can continue to be used effectively. Along the adjacent service streets, however, where sidewalks and shopfronts would be anticipated, pedestrian-scaled streetlights would be better employed. (More on this in the **Streetlights** chapter.)

**Policy S-7: Master streetscape plans and special thoroughfare corridor controls shall be employed as necessary to improve the function and appearance of major streets, including traffic movement, as well as signage, architecture, building and parking placement, landscaping, underground utilities, etc.**

Salisbury's single greatest "windows to the world", its major thoroughfares, warrant special attention and should be treated as such. There is no better example of this than the Innes Street Corridor between downtown Salisbury and its intersection with Interstate 85. Salisbury's civic leaders, recognizing the significance of the Innes Street Corridor, organized a special planning effort to study and make recommendations for improving the function and appearance of this major entryway into Salisbury. Implementation actions coming out of this special planning process included the establishment of a Visual Corridor Overlay District (VCOD) within the City's zoning ordinance. As noted in the policy chapter on **Existing, Newer Commercial Areas**, the VCOD includes standards for building placement and design, parking, landscaping, lighting, and other design factors.

In addition to the Innes Street Corridor, other major street corridors including, particularly, Statesville Boulevard and Jake Alexander Boulevard, should be considered prime candidates for similar planning initiatives. The City's efforts in this regard will require considerable energy, including much involvement by property owners and the public in general. However, such efforts not only make the city more attractive and functional for residents, but also serve as one of the city's most visible forms of self-promotion for quality economic development.

**Policy S-8: Road widenings and/or the designation of one-way pairs shall not be allowed for streets where the original design intent was otherwise. This policy is intended to prevent degradation of the design integrity and livability of an existing residential or commercial area for the primary purpose of moving greater traffic volumes. Exceptions to this policy may include actions to correct critical safety problems.**

This policy is intended to address road widenings or the designation of a one-way pair in existing, developed parts of town. Proponents of such actions argue that they are necessary to alleviate traffic congestion, and to allow for improved access from the suburbs into the older parts of the city. Unfortunately, most often the end result is quite the opposite- such improvements make access to cheaper land, farther out, more convenient at the expense of the older parts of town. In other words, such widenings or one-way designations simply make suburban raw land and developments more accessible and attractive to the homebuyer compared to in-town neighborhoods or other close-in developments. Meanwhile residents and businesses located along such streets suffer the consequences of (1) more traffic lanes than the right of way was designed to accommodate and/or (2) greater traffic volumes than the street was ever intended to handle and/or (3) a general decline in the

livability of the area through which the street passes. A better alternative is to channel the demand for ever more remote, automobile-dependent subdivisions into full service neighborhoods closer in.

*A note on why adding another lane to the highway usually doesn't solve traffic congestion.*

People are often amazed at how quickly a major road, upon being widened for extra lanes, and often at enormous expense, becomes congested again. Where do all the cars come from so suddenly?

The reasons are not as difficult to understand as one might think. First, studies show that commuters, who adjusted their travel times to avoid the peak rush hour, don't do so anymore. Second, commuters who were previously relying upon another, less congested route, don't bother to use it anymore. Third, people who may have been carpooling before, may stop carpooling. Fourth, workers who chose to work elsewhere to avoid the congestion, may change their employment to take advantage of the "better drive time". Fifth, those motorists who previously would go out of their way just to avoid driving on "that awful road" now return to it (temporarily). And sixth, developers anticipate the opening of a new or wider road and place many new development projects in the pipeline, to take advantage of buyers moving out to find cheaper home prices in the now more accessible suburbs.

The unfortunate result of all these individual decisions is that a road project, costing tens of millions of dollars, may have a beneficial window of improved driving conditions and shorter travel times of, perhaps, two years. Again, the better option is to encourage mixed use developments closer in, require a true network of interconnected streets, and/or consider putting the taxpayers' money into a new parallel roadway (no more than one mile away, as per **Policy S-1**).

*Reducing the "cost" of travel by expanding the roadway is like cutting the price of an item in the supermarket: demand for it will suddenly rise.*

**Lewis Fulton**  
International Energy Agency  
January 2000

### ***Summary of Policies for Major Streets***

***Policy S-1: Major streets should be spaced no more than one mile apart east to west and north to south whenever topographic and other physical conditions allow.***

***Policy S-2: Access to major streets shall be from intersecting minor streets, rather than private driveways, whenever possible.***

***Policy S-3: Central medians shall be incorporated into the design of new or improved major streets whenever possible.***

***Policy S-4: Under specified conditions, minor streets should be located so as to intersect with major streets at regularly spaced, reasonably frequent (400' to 600') intervals.***

***Policy S-5: Landscaping, and where possible, street trees should be planted in central medians and plaza strips of major streets.***

***Policy S-6: Streetlights shall be selected and installed according to the design speed and intended use of the street they serve.***

***Policy S-7: Master streetscape plans and special thoroughfare corridor controls shall be employed as necessary to improve the***

*function and appearance of major streets, including traffic movement, as well as signage, architecture, building and parking placement, landscaping, underground utilities, etc.*

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## POLICIES FOR MINOR STREETS

*Note: As defined in this plan, minor streets are any streets other than limited access expressways and major thoroughfares. As such, there can be considerable variation in the size and character of minor streets, depending upon their intended use.*

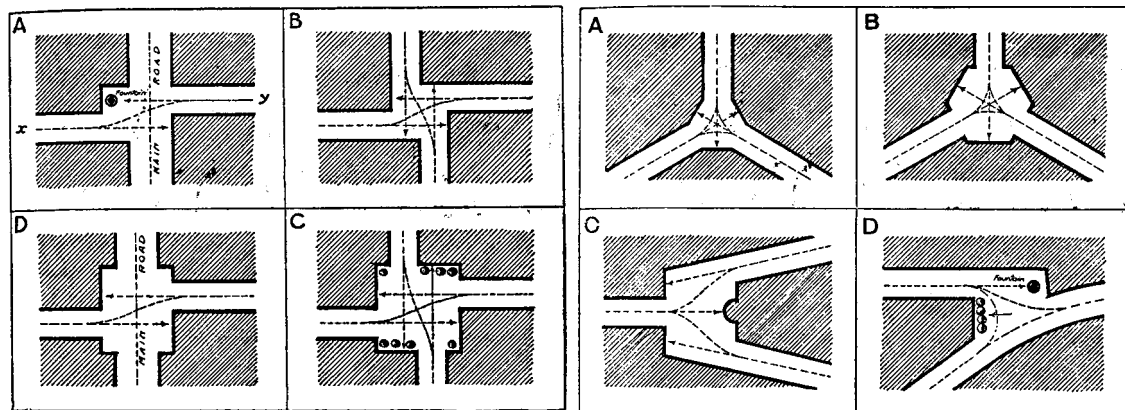
**Policy S-9: The City shall encourage street patterns that respond to site topography, accentuate focal points and interesting vistas, create interesting public spaces and intersections, and that are coordinated with the placement of significant structures or open spaces.**

In the years between 1900 and the Second World War, no single component of town planning received more attention than street layout and design. Streets were viewed as the critical skeleton upon which all new development was to depend. Reliance on the electric streetcar, for example, required neighborhood street and sidewalk designers to be sensitive to the location of transit lines and stops. Solar orientation of streets was important because of the lack of modern day heating and cooling systems in the buildings of that era. Streets were also oftentimes designed for maximum visual effect, leading up to public parks, or important buildings and churches, etc. In fact, the design, architectural style and placement of prominent buildings were frequently decided in advance so that the layout of the streets could be properly tailored.

*Whatever the character of the street, it is of the utmost importance to avoid mere aimless wiggles.*

**Raymond Unwin, 1909**

Minor intersections that are offset, or come together at angles other than a right angle, can create memorable reference points of special interest in a neighborhood. As shown in several of the examples below, such intersections can also create good opportunities for the closing of vistas. And, contrary to “contemporary” traffic engineering thought, such minor street intersections can cause motorists to be more attentive to safe turning movements.

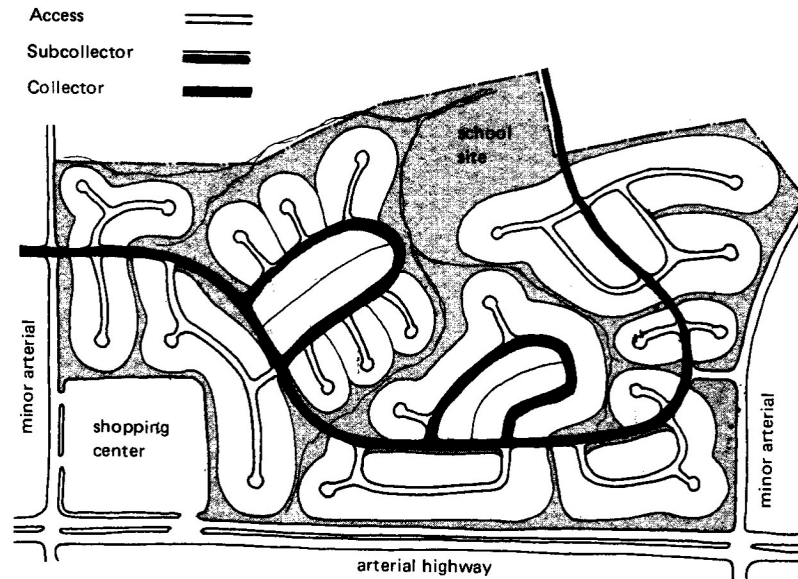


In Salisbury, one example of an interesting public space created by a minor intersection can be found at the intersection of Circle Drive and Henderson Street, where a roundabout once existed. While the roundabout is now gone, the space it occupied is still apparent.

By contrast, today's subdivision layouts seem to have become primarily concerned with maximizing the number of lots that can be cut out of a given parcel of land (hence, the expression "cookie cutter subdivision").

Streets wind aimlessly, not based upon topography or natural assets, but rather as a convenient way to shorten or close street vistas without much thought, creativity, or effort. It is not unusual for strangers to a modern day subdivision to become quickly disoriented by the lack of order and discernable landmarks in a new subdivision.

A neighborhood street system that is "designed" like a plate of spaghetti isolates everyone and is very disorienting. It also costs more to deliver services. (Also, note the location of the shopping center, with no way to get to it except by traveling out onto a major thoroughfare.)



Neighborhood street layout should be restored to the art and science that it once was and can be again. Design criteria may include the appropriate use of winding or curved streets only where topography or natural amenities dictate, the creation of enclosed street *places* (i.e. squares, circles, parks, etc.) where intersections offer opportunity, and the thoughtful use of narrow streets with "T" and "Y" intersections to discourage major cut-throughs and to provide termination points for street vistas. The ability to properly execute these design concepts will likely require new training, retraining and continuing education of land planners, civil engineers, landscape architects, architects, city planners, surveyors, and other design professionals involved in the land development business.

***Policy S-10: Minor streets shall be developed in short blocks of 300 to 500 feet in length.***

*Isolated street neighborhoods that do have definite boundaries can be found in plenty, to be sure. They are typically associated with long blocks (and hence with infrequent streets), because long blocks tend almost always to be physically self-isolating.*

***Jane Jacobs, 1961***

Short street blocks accomplish several worthwhile objectives. First, short blocks prevent individual streets from becoming socially isolated from adjacent street neighborhoods. In other words, they encourage neighborhood cohesion beyond what typically occurs on a single long street. This is more important than ever today, where people are sorted into age and income groups by the price of the houses in which they live.

Second, short blocks, when laid out in a fully developed honeycomb of streets, allow for a multitude of alternative routes for people to take in getting from one place to another. In the case of vehicular traffic, this pattern distributes traffic loads over the entire street network of the neighborhood planning area, rather than concentrating traffic on just a few overwhelmed, traffic clogged, collectors or arterials. In the case of pedestrian traffic, a full honeycomb of streets provides a multitude of options for walking. Short blocks also provide for frequent breaks for the



pedestrian. Studies have shown that short blocks make a walk a more enjoyable experience.

How short is short enough? Block lengths of 300 to 400 feet are ideal; 400 to 500 foot long block is still acceptable. As block lengths approach 600 feet or more, however, adjacent blocks tend to become isolated from each other. Interestingly, blocks in Salisbury's West Square historic district are about 400 feet long, just about ideal.

***Policy S-11: Street widths shall be designed to fit the intended use of the street, corresponding to the traffic load and planned development types. Minor streets shall be no wider than necessary to serve their intended use.***

When streets are made unnecessarily wide, motorists have a natural tendency to want to travel fast, no matter what the posted speed limit. Experience and logic indicates that the best way to regulate traffic speed and movement is to design the streets from the outset *according to the traffic load anticipated and the development types planned for.*

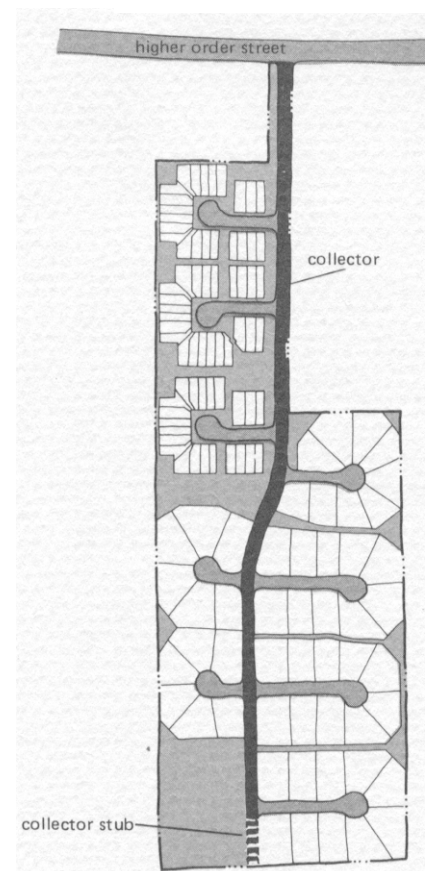
Narrow streets naturally slow traffic (especially if they are kept short, have frequent, planned interruptions and jogs, and allow on-street parking. They also are more affordable to build and maintain. Their lower initial construction cost to the developer helps keep down the price of new housing. In addition, they minimize heat buildup in the summer months and storm water runoff by reducing exposed impervious surface area. Narrow streets also create a sense of "street space" that is desirable for the neighborhood resident and pedestrians in particular. Minor residential streets, after all, should give equal priority to the pedestrian and the automobile. (Also see Section on the *Neighborhoods Yet To Be*)

Commendably, the City of Salisbury has been moving in the direction of narrower streets for about a decade. Since 1991, the City has had a minor street width requirement of 26 feet (measured from back of curb to back of curb). This street width allows for a three lane cross section- one row of parked cars, and two travel lanes. Unfortunately, the City now allows rolled or valley type curbing, rather than vertical curbing along its minor streets. This type of curb is less effective than a true vertical curb in containing vehicles within the paved street area. (See **Policy S-13** for more on this design issue.)

***Policy S-12: A fully connected honeycomb of streets shall promote convenient circulation within the neighborhood and provide for multiple, alternative outlets from the area to adjoining neighborhoods and major streets. Care shall be taken that cut-through traffic routes are avoided.***

One of the problems of the current style of street layout in residential subdivisions is the overuse of cul-de-sacs. These streets, basically isolated and minimally connected to other streets in the neighborhood, prevent the pedestrian, bicyclist, and driver from employing the full system of streets in the neighborhood. They are also disorienting and make public and private services such as trash collection, school bus service, mail delivery, and police protection more expensive to deliver.

The neighborhood layout below isolates each cul de sac unto itself and forces all traffic out to the major thoroughfare. The collector stub promises to force even more traffic onto the single collector street which effectively divides the neighborhood in two. Chances are, there would be very little pedestrian activity in this neighborhood, outside the immediate environs of each cul de sac.



*You can have nice streets, and you can put trees back on them, and you can make beautiful buildings with front porches again, but if the only place it leads is out to the expressway, then we are going to have the same (disconnected, unlivable) environment all over again.*

**Peter Calthorpe**, as quoted in *Time Magazine*, May 20, 1991

In addition, the post-war street system hierarchy of *local streets*, *collectors*, *thoroughfares*, etc. requires that all traffic funnel onto the next level of street in the hierarchy, culminating at the major thoroughfare. This creates increasing traffic and congestion with each step up in the hierarchy. It also prevents children (and adults) from walking or biking to nearby friends, public parks, services, etc. because they must deal with a street system hierarchy which forces them onto higher level, traffic-congested streets.

It is important, therefore, that a full "honeycomb of streets" be developed within and between neighborhoods, with many route options available. By requiring that the vast majority of neighborhood street *ends* (i.e. both ends of nearly all streets) terminate at another street, this objective is achieved. At the same time, this recommendation does not prevent the occasional use of a short cul de sac, "eye brow", or loop road for variety, or where circumstances offer no alternative.

One way to implement a requirement for connected streets is through the use of a "connectivity index" in the City's development regulations, most often the subdivision regulations. The connectivity index, expressed as a fraction, is the ratio of the total number of street ends in the development to the number of street ends terminating at another street. In this sense, it is a straightforward performance standard that can be employed to measure conformance with the requirement.



Finally it should be noted that a "connected" street pattern need not be a "cut through" street pattern. The thoughtful use of T and Y intersections, the placement of parks, the use of stop signs and other traffic control devices, and multiple outlets to major streets can promote good internal circulation and traffic dispersion without encouraging cut through traffic from outside the neighborhood.

(Methods of addressing cut through traffic are generally described in **Policy S-9** above and in the chapter on **Neighborhoods Yet To Be**. Also see **Policy S-4** in the **Major Streets** section concerning minor street intersections with major streets at regularly spaced, reasonably frequent (400' to 600') intervals.)

***Policy S-13: On-street parking shall be encouraged in compact neighborhoods. Vertical curbing shall be preferred over rolled or valley curbing to properly contain vehicles within the borders of the paved street area.***

On-street parking is a highly efficient form of parking, especially where higher housing densities and a compact neighborhood are desired. On-street parking should be especially encouraged near the center of the neighborhood planning area, closest to the neighborhood focal point, services and transit stop, etc.

It should be noted that a street's capacity for on-street parking spaces is directly influenced by the number of driveways/curb cuts interrupting the length of useful curb. On-street parking works best in front of residences that are served by alleys to the rear. Alleys eliminate the demand for automobile access to the property from the front, and hence the need for curb cuts. Rear alley access also allows the developer to use true vertical curbing in front, rather than slope faced (or valley) curbing.\* Also, after a street is paved a few times, the utility of a slope faced/valley curb may become "lost"; a vertical curb, on the other hand retains its function even after several repavings.

Finally, on-street parking and true vertical curbing provide an important physical and psychological buffer between pedestrians on the sidewalk and traffic passing on the street. A sidewalk immediately adjoining a traffic lane is a poor design for a street and makes pedestrians very uncomfortable while walking only a foot or two from fast moving cars and trucks. Furthermore, the fear that on-street parking will create situations where small children dart from behind a parked car into passing traffic is not borne out by actual experience, but continues to be a commonly held perception.

*Note on the Cost of Removing Vertical Curbing*

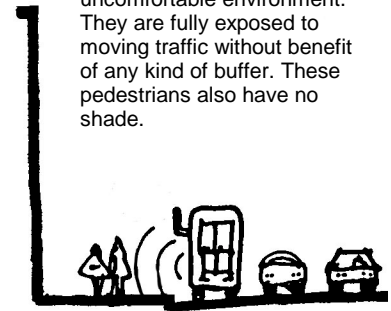
Slope faced curbing came about in large measure because it allowed the developer to place a front yard driveway anywhere along the length of the lot frontage without having to remove a section of curbing. Some questions have been raised concerning the additional costs involved in removing a section of vertical curbing to install a driveway apron. Currently, the City will remove a vertical curb section for \$3 per curb foot, or less than \$50 for a typical residential driveway.

***Policy S-14: Conservation subdivisions, those designed to minimize environmental disturbance and protect adjoining natural resources, shall employ grassed swales to capture stormwater runoff, filter out pollutants and recharge groundwater resources.***

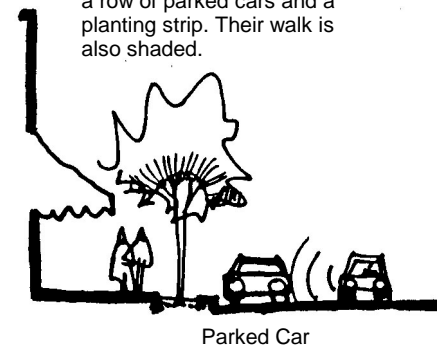
In general, this plan calls for neighborhood designs that foster compact growth and the retention of meaningful open space on surrounding non-urban lands. There are circumstances, however, when development occurs on lands adjoining sensitive environmental resources. In such instances, a “conservation subdivision” may be called for. Such subdivisions typically work to mitigate against environmental disturbances and natural resource degradation by minimizing land clearing, tree removal, and reducing stormwater runoff.

Methods of reducing stormwater runoff include, principally, the minimization of impervious surface areas (roofs, driveways, sidewalks, patios and other paved areas), the retention of natural ground covers and vegetation, and capturing and holding stormwater runoff on site. One of the most effective and economical ways of reducing stormwater runoff is to create grassed swales to capture runoff, filter out stormwater pollutants, and allow for percolation of the rainwater into the ground. Grassed swales differ from drainage ditches in that their gently curving cross section make them more attractive and increase the grassed surface area over which the stormwater must pass.

This illustration shows pedestrians in a hostile, uncomfortable environment. They are fully exposed to moving traffic without benefit of any kind of buffer. These pedestrians also have no shade.



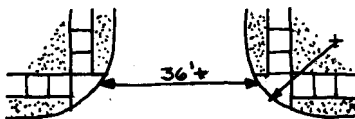
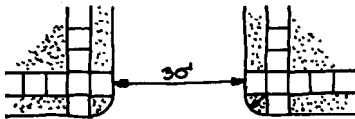
This illustration shows pedestrians in a comfortable environment. They are buffered from moving traffic by a row of parked cars and a planting strip. Their walk is also shaded.



Parked Car

***Policy S-15: The turning radius of corners at intersections involving minor streets shall be as small as possible while allowing for reasonable truck and emergency vehicle maneuvering.***

Pedestrian safety in crossing a street is determined in part by how long it takes a pedestrian to cross from one side of the street to the other. The time required to cross the street is determined essentially by the distance from curb to curb. In the old days, this meant that a pedestrian would have to travel, for example, 30 feet from curb to curb if the street were 30 feet wide. Today, however, due to increased turning radii at intersections, the actual distance required to cross a 30-foot wide street may be closer to 40 feet. This is because the large turning radius associated with many street corners puts more flare in the turn, and pulls the sidewalk ends farther apart. (See diagram)



A bigger turning radius at intersections makes the crossing distance longer for pedestrians and encourages cars to speed around corners.

Larger turning radii have been justified to allow cars to go faster around corners. While such an objective may have merit at the intersection of two major streets, it is certainly not justified at the intersection of two minor streets. Larger turning radii give undue preference to the automobile and actually make streets less safe for pedestrians. It is symptomatic of the post war tendency to cater to the needs of the automobile while ignoring the pedestrian.

Another argument for bigger turning radii is that today's large trash trucks and fire trucks require bigger turning radii to negotiate around street corners. While there is some truth to this, actual demonstrations in the field have proven that today's large trucks can negotiate smaller turning radii than generally thought. While street corners may not need to be as "squared off" as 100 years ago, they also do not need to cater totally to the fast moving automobile.

***Policy S-16: The City shall employ traffic calming methods on neighborhood streets as necessary to enhance livability and restore the balance between pedestrian, bicycle and automobile use. Implementation of such methods shall be conducted with full participation and input from neighborhood residents.***

Traffic calming may be defined as "a form of traffic planning that seeks to equalize the use of streets between automobiles, pedestrians, bicyclists, and playing children. This is accomplished through the use of devices and techniques that reduce traffic volume and speed in neighborhoods while maintaining maximum mobility and access. Traffic calming also attempts to make drivers aware of the fact that they are sharing the space of the street with other users." (Hoyle, Cynthia L. **Traffic Calming**, Planning Advisory Service Report Number 456, American Planning Association, July 1995)

There are two categories of traffic calming techniques: active and passive. Active (physical) techniques include: speed bumps, speed tables, rumble strips, median barriers, cul-de-sacs, semi diverters, traffic circles, chokers, interrupted site lines, neck downs, chicanes, changes in direction, and protected parking. Active techniques change driver behavior and are therefore largely self-enforcing. They also create the visual impression that a street is not meant for through traffic and that other users of the roadway, such as pedestrians, cyclists, and children playing have an equal right to the use of the street.

Passive techniques are primarily traffic signs (e.g. Stop, Yield, speed limits, turn prohibitions, one-way, "Slow, School Zone", "Do Not Enter", "Not A Through Street", "Dead End", "Local Access Only", truck restrictions, etc.) Other passive control devices include traffic signals and pavement markings such as crosswalks and lateral bars. While using regulatory signs to inform drivers, passive control devices, do not physically prevent an action. Passive devices are most effective in areas where compliance can be expected to be high and enforcement is possible. (For a full description and discussion of the advantages and disadvantages of various active and passive traffic control devices, the reader is directed to the publication cited at the end of the preceding paragraph.)

Regardless of the method or control device employed, it is critically important that neighborhood residents be fully involved in the planning and implementation of any traffic calming measures. Community involvement requires two-way communication between traffic planning professionals and area residents. Resident input allows the professionals to see the problems from the residents' point of view and may reveal insights that the professional might not be aware of; the interaction between the planning professional and area residents can help those involved understand, the legal, physical and financial constraints of the various options available.

### **Summary of Policies for Minor Streets**

***Policy S-9: The City shall encourage street patterns that respond to site topography, accentuate focal points and interesting vistas, create interesting public spaces and intersections, and that are coordinated with the placement of significant structures or open spaces.***

***Policy S-10: Minor streets shall be developed in short blocks of 300 to 500 feet in length.***

***Policy S-11: Street widths shall be designed to fit the intended use of the street, corresponding to the traffic load and planned development types. Minor streets shall be no wider than necessary to serve their intended use.***

***Policy S-12: A fully connected honeycomb of streets shall promote convenient circulation within the neighborhood and provide for multiple, alternative outlets from the area to adjoining neighborhoods and major streets. Care shall be taken that the creation of cut-through traffic routes are avoided.***

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